

**Amendments to the Specification**

The following paragraphs have been canceled in this paper:

0004-0009, 0011-0015, 0018-0044, and 0053-0073, and the following paragraphs are amended as indicated below.

Replace original paragraph 0010 with amended paragraph 0010 below.

**[0010]**     A medium voltage controller for electrical equipment, such as motors, transformers, reactors, and capacitors, is provided. A load discharge device (LDA) is included for grounding the load before the contactor can be removed from the controller. The LDA has a scissors-type closing mechanism, which, when actuated after being charged, causes a bar to contact each of the load conductors.

Replace original paragraph 0016 with amended paragraph 0016 below.

**[0016]**     The above-mentioned features of the invention will become more clearly understood from the following detailed description of the invention read together with the drawings in which:

Figure 1 is a perspective view of a group of five controllers;

Figure 2 is a schematic diagram of a controller;

~~Figure 3 is a perspective view of a motor controller with one side panel removed;~~

~~Figure 4A is a perspective view of a cut away of a rear panel;~~

~~Figure 4B is a cut away top view of the rear panel;~~

~~Figure 5 is a perspective view of an exhaust vent on the top panel of the cabinet;~~

24

25 ~~Figure 6 is a partial view of two mounting dimples;~~

26 ~~Figure 7 is a side section view of a dimple in a dimple assembly;~~

27 ~~Figure 8A is a partial perspective view of a front door and latching plate;~~

28 ~~Figure 8B is a partial plan view of a door latch;~~

29 ~~Figure 8C is a partial plan view of a door hinge;~~

30 ~~Figure 9 is a perspective view of a terminal and a cable;~~

31 ~~Figure 10 is a perspective view of a terminal swaged to a cable;~~

32 ~~Figure 11 is a perspective view of a contact finger and a terminal stab;~~

33 ~~Figure 12 is a side view of a contact finger and stab;~~

34 ~~Figure 13A is a right side perspective view of the instrument compartment with~~  
35 ~~the door open and the instrument panel extended and swung out;~~

36 ~~Figure 13B is a top plan view of the instrument compartment as illustrated in~~  
37 ~~Figure 13A;~~

38 ~~Figure 14 is a left side perspective view of the instrument compartment with~~  
39 ~~the door open and the instrument panel extended;~~

40 ~~Figure 15 is a perspective view of the contactor truck resting partially pulled~~  
41 ~~out from its fully inserted position;~~

42 ~~Figure 16 is a side view of the contactor truck in the position as illustrated in~~  
43 ~~Figure 15;~~

44 ~~Figure 17 is a plan view of the contactor truck in the fully inserted position;~~

45 ~~Figure 183A is a perspective view of a load discharge device;~~

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47 Figure 183B is a plan view of a portion of the load discharge device, showing  
48 the device in the charged position;

49 Figure 183C is a plan view of a portion of the load discharge device, showing  
50 the device in the earthed position;

51 Figure 183D is a plan view of the load discharge device scissors-type linkage;

52 Figure 183E illustrates a terminal lug for the load discharge device;

53 ~~Figure 19 illustrates the disconnect switch and the fuses;~~

54 ~~Figure 20A illustrates a two fuse holder;~~

55 ~~Figure 20B illustrates a three fuse holder assembly;~~

56 ~~Figure 21 illustrates the housing of the disconnect switch and a switch~~  
57 ~~illuminator;~~

58 ~~Figure 22 illustrates the internals of the disconnect switch in the open~~  
59 ~~position;~~

60 ~~Figure 23 illustrates a cross section view of the internals of the disconnect~~  
61 ~~switch;~~

62 ~~Figure 24 illustrates a switch illuminator for illuminating the internal of the~~  
63 ~~disconnect switch;~~

64 ~~Figure 25 illustrates a simple schematic diagram for the switch illuminator;~~

65 ~~Figure 26 illustrates a schematic of a low power current transformer;~~

66 ~~Figure 27 illustrates a block diagram of an internal temperature monitoring~~  
67 ~~system; and~~

68 ~~Figure 28 illustrates the wave forms for the source and reflected optical signals.~~

69

70 Replace original paragraph 0045 with amended paragraph 0045 below.

71 **[0045]** Figure ~~183~~A illustrates a load discharge device (LDA), or load-cable  
72 earthing switch, **1810**, which is an apparatus for grounding the load-side conductors  
73 when the contactor is in the open position. The LDA **1810** is illustrated schematically  
74 as a switch **214** in Figure 2. The LDA **1810** illustrated in Figure 18A is in the  
75 unearthed position, that is, the earthing bar **1806** is positioned away from the  
76 terminal lugs **1802** and the springs (only one spring **1844** is illustrated, the other is  
77 hidden by the insulating tube **1842**) are charged, or compressed. The illustrated  
78 embodiments of the LDA **1810** are low-profile devices that occupy little more space  
79 than the load-side terminals. The LDA **1810** includes a molded base **1872** that  
80 secures many of the individual components. In one embodiment, the support plate  
81 **1874** is attached to the molded base **1872**. In another embodiment, the support  
82 plate **1874** and the molded base **1872** form an integral piece.

83 Replace original paragraph 0046 with amended paragraph 0046 below.

84 **[0046]** The LDA operator **1815** has a racking connector **1812**, which engages a  
85 racking screw **1814**, and flag windows **1817** and **1819**, which indicate the earthing  
86 switch **1810** position and LDA **1810** charged status. When tripped, the earthing bar  
87 **1806** is pushed by the springs **1844** against the terminal lugs **1802**, causing the  
88 terminal lugs **1802** to be shorted and earthed through the earthing connection **1804**.  
89 For illustration purposes, three different sizes of terminal lugs **1802A**, **1802B**, and  
90 **1802C** are shown in Figure ~~183~~A. Two lugs **1802A** and **1802C** each have a small  
91 opening **1803A** and **1803C** for receiving a conductor having a low or medium current  
92 rating. The center lug **1802B** has a large opening **1803B** for receiving a large  
93 conductor with a high current carrying capacity. ~~The lugs 1802 are swaged to the~~  
94 ~~conductors as illustrated in Figure 10.~~

95 Replace original paragraph 0047 with amended paragraph 0047 below.

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98 **[0047]** Figures 183B and 183C illustrate the position of the earthing bar 1806  
99 with respect to the lugs 1802. In Figure 183B, the earthing bar 1806 is in the  
100 ungrounded position and the LDA 1810 is charged and ready to earth the load-side  
101 conductors. In Figure 183C, the earthing bar 1806 is in the earthing position; that is,  
102 the earthing bar 1806 is in contact with the grounding notch 1854 (see Figure 183E)  
103 on each of the lugs 1802. The earthing bar 1806 engages a first end of the springs  
104 1844 and has a grounding connector 1804 for connecting the earthing bar 1806 to  
105 earth. The second end of the springs 1844 rests against the base 1872. The springs  
106 1844 provide the motive force for earthing by quickly forcing the earthing bar 1806  
107 against the lugs 1802 when the LDA 1810 is tripped. In the embodiment illustrated  
108 in Figures 183A, 183B, and 183C, the earthing bar 1806 is a plate that contacts the  
109 springs 1844 and the lugs 1802. In another embodiment, illustrated in Figure 183D,  
110 the earthing bar 1806' is a round bar that contacts the springs 1844 and the lugs  
111 1802.

112 Replace original paragraph 0048 with amended paragraph 0048 below.

113 **[0048]** Figure 183D illustrates the position of the actuating mechanism and the  
114 charging mechanism on the support plate 1874 when the LDA 1810 is in the earthed  
115 position. As illustrated in Figure 183A, when the LDA 1810 is charged, the scissors-  
116 type linkage first member 1832 and second member 1828 are aligned in an almost-  
117 straight-line alignment and have a common first pivot 1860 constrained in a slot  
118 1862 in a third member 1830. Because the linkage members 1832 and 1828 are  
119 aligned with the pivot 1860 below the straight-line alignment position and the pivot  
120 1860 is restrained from moving lower vertically by a stop 1864 on the backing plate  
121 1874, the linkage members 1832 and 1828 are fixed in position by the springs 1844  
122 and hold the linkage in a stable over-toggle position. The LDA 1810 is tripped by  
123 rotating the screw 1814 which rotates the plate 1816 about the hex nut pivot 1831.  
124 The counter-clockwise rotation of plate 1816 forces the vertical member 1830  
125 upwards pushing the pivot 1860 vertically. This rotates the member 1832 out of the  
126 almost-straight-line alignment (toggle) with the member 1828. Once the pivot 1860

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128 is above the straight-line alignment position, the members 1832 and 1828 no longer  
129 oppose the springs 1844. The unrestrained springs 1844 force the rails 1822A and  
130 1822B and the connecting member 1826 to travel toward the vertical member 1830,  
131 causing members 1832 and 1828 to fold around the pivot 1860, such as scissors do  
132 when closing.

133 Replace original paragraph 0052 with amended paragraph 0052 below.

134 **[0052]** Figure 183E illustrates terminal lug 1802A, which has a barrel 1852, a  
135 lug pad 1856, and a grounding bevel 1854. The grounding bevel 1854 forms a notch  
136 with the molded base 1872 when the lug 1802A is adjacent the molded base 1872.  
137 The lug pad 1856 has a flat surface for connecting the load-side cable terminal lug  
138 (not illustrated). The lug pad 1856 has two openings 1858A and 1858B, through  
139 which mounting fasteners pass and secure the load-side cable terminal connection.  
140 The lug 1802A has an opening 1803A that passes through the barrel 1852 and  
141 receives a cable conductor. ~~The lug 1802A can be swaged to the conductor in a~~  
142 ~~manner as illustrated in Figure 10. Those skilled in the art will recognize that other~~  
143 ~~means for connecting the conductor to the lug 1802A can be employed without~~  
144 ~~departing from the spirit and scope of the present invention.~~ The lug 1802A has a  
145 tang 1853 that protrudes perpendicular to the barrel 1852 and is received by a slot  
146 in the lug holder 1805. The tang 1853 secures the lug 1802A and prevents the lug  
147 1802A from being displaced longitudinally when the earthing bar 1806 strikes the  
148 grounding bevel 1854. The opening 1858C receives a pin, fastener, or other  
149 positioning member that secures the lug 1802A and prevents the lug 1802A from  
150 being displaced orthogonally from the support plate 1874 when the earthing bar  
151 1806 strikes the grounding bevel 1854.